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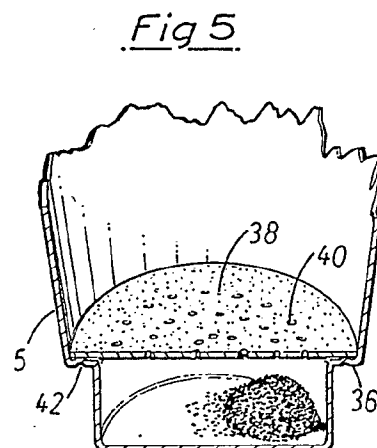
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## (54) In-cup drink and drinking cup

(57) An in-cup type drink wherein an infusible solid such as tea, either in the form of loose tea-leaves or in a tea-bag, is constrained permanently adjacent the bottom of a cup by means of a liquid-permeable retaining means which is fixed to the side wall or base of the cup.



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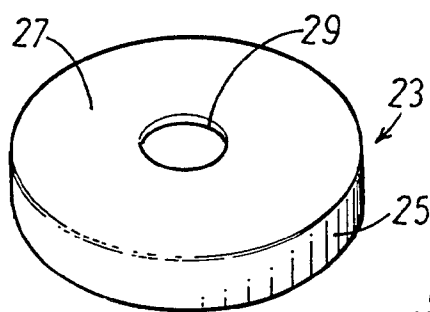
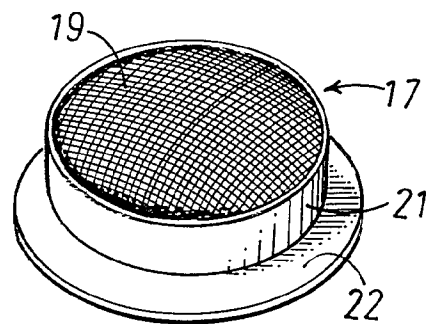
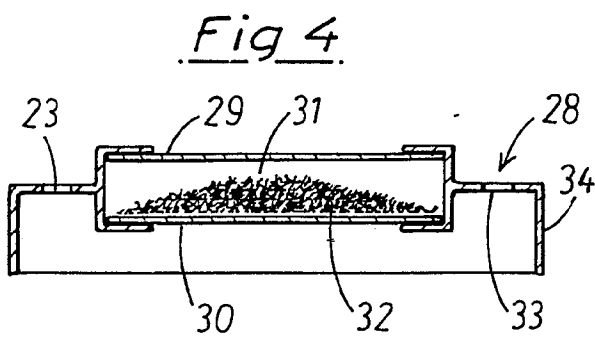
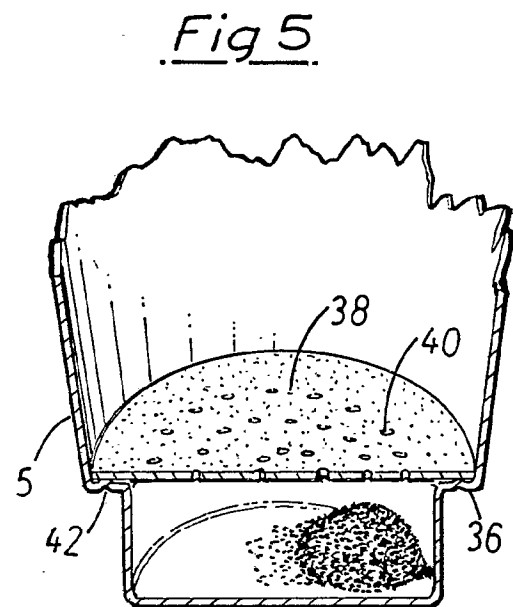
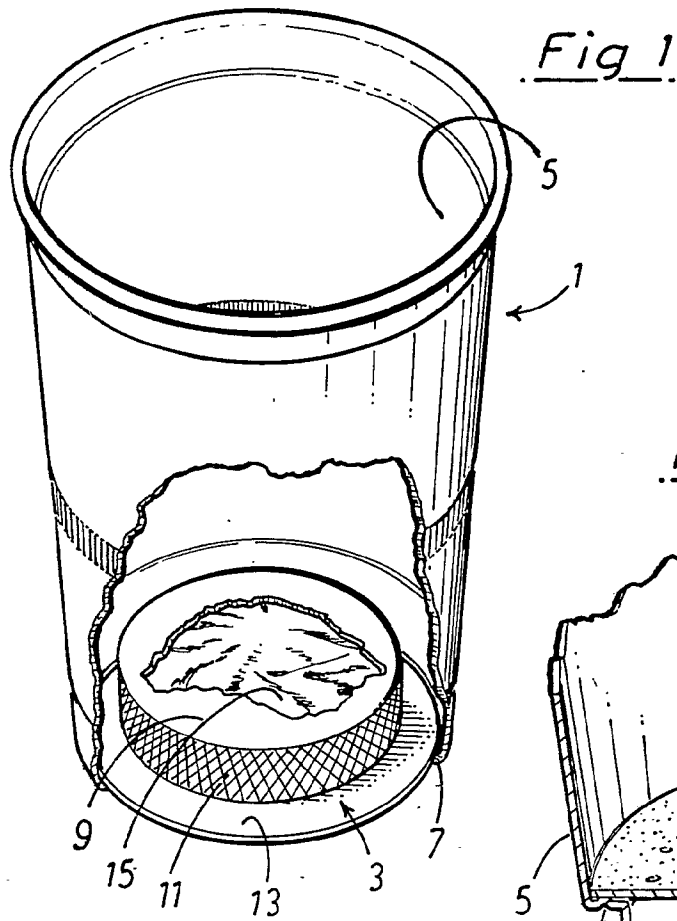


Fig 2

## SPECIFICATION

**In-cup drink and drinking cup**

5 The present invention relates to a drinking cup, and more particularly to a drinking cup for preparing an infusion, e.g. tea, for drinking whilst retaining solid residue within the cup.

Tea is the most popular drink in Britain. It is one of several drinks which is prepared by infusing a solid (in this case tea-leaves) in boiling water. The major problem in preparing tea is that the tea-leaves remain as a solid residue in the drink once infusion is complete. These are unpleasant to swallow and create extra work when the implements used are cleaned.

Although this is merely inconvenient in a private household when only a few individuals are drinking tea, in an establishment catering for many people, such as a hospital, such a problem is exceptionally time-consuming and thus expensive.

There are three methods currently used to partially overcome this problem. The first is to employ a machine, which is often coin-operated, and which brews the tea and filters out the solid residue. These machines, however, are costly to run and are exceptionally time-consuming as they only brew a single cup at a time.

A second way of avoiding the disadvantage of tea-leaves is the use of a tea-bag in each cup. However, it is aesthetically unpleasant to leave the tea-bag in the cup when the tea is being drunk, and the removal of each tea-bag from its cup is time-consuming. Further work is created in hospitals where the tea-bags must be carefully disposed of for health reasons, in addition to the necessity of sterilizing or disposing of the drinking vessels used.

Finally, several types of 'instant' tea have been tried as a substitute for infused tea. These 'instant' teas are generally in the form of powders which dissolve completely in boiling water to form a drink. However, the solution formed tastes almost, but not quite, entirely unlike tea and is hence generally unacceptable.

"Instant" drinks are conventionally made by one of two methods. In one method the tea powder is mixed with hot water (plus milk and/or sugar as required) externally of the cup, the mixture then being dispensed into the cup. In the other method, known as the "in-cup" type, the ingredients (other than the water) are provided already in the cup itself and one merely has to add the hot water to achieve a drink ready for consumption.

The present inventor recognised the need to produce a method of preparing an infusion for drinking which does not necessitate the removal of any solid residue, but in which the residue does not interfere with the consumption of the infusion. It is an object of the present invention to fill this need.

According to a first aspect of the present invention there is provided an in-cup type drink wherein tea, either in the form of loose tea-leaves or in a tea-bag, is constrained permanently adjacent the bottom of a cup by means of a liquid-permeable

retaining means which is fixed to the side wall or base of the cup.

Preferably, the retaining means is fixed to the side wall of the cup by virtue of an interference fit therebetween.

According to a second aspect of the present invention, there is provided a drinking cup comprising a base and a side wall; solid material, to form an infusion with a liquid, lying at the closed end of said cup; and a liquid-permeable retaining means, positioned between the open end of said cup and said solid material, arranged to prevent displacement of solid residue past said retaining means during consumption of the infusion.

Preferably the cup is disposable and most preferably made of a plastics material. The solid material is preferably leaf-tea or a tea-bag, although other infusable solids may be used, such as coffee, herbs, or dried fruit. The retaining means should be so constructed as to allow easy flow of the liquid around the solid material to allow the infusion to be of relatively constant concentration throughout the cup. Although the retaining member may comprise a flimsy liquid-permeable material, such as paper, it is possible to use either a tougher liquid-permeable material, or a tougher liquid-impermeable material with at least one hole in it to render it fluid-permeable. The retaining member may also be resiliently deformable to allow it to be pressed down onto the solid material to speed up the infusion process. Preferably the retaining means is formed separately of the cup to aid manufacture of the completed cup. More preferably, the retaining means is inserted into the cup in a close interference fit.

Specific embodiments of the present invention will be further described, by way of example only, with reference to the accompanying drawings, in which:

*Figure 1* is a partially broken away, perspective view of one embodiment of a drinking cup in accordance with the present invention;

*Figure 2* shows part of a second embodiment of a drinking cup in accordance with the present invention;

*Figure 3* shows part of a further embodiment of a drinking cup in accordance with the present invention; and

*Figures 4 and 5* show parts of still further embodiments in accordance with the invention.

Figure 1 illustrates a cup 1 comprising a substantially cylindrical wall 5 and a base 7. Inserted in the cup 1, in a close interference fit, is a plastics retaining means 3, which is resiliently deformable and comprises a domed shell 9, a cylindrical mesh wall 11 and a base rim 13.

Leaf tea, enclosed in a tea-bag 15, is used to prepare a tea drink, and is positioned on the base 7 beneath the retaining means 3. The retaining means 3 is held in place by the base rim 13 establishing a close interference fit with the wall 5. The shell 9 and the mesh wall 11 are made of a resiliently deformable plastics material.

When boiling water is poured into the cup 1 it flows through the mesh walls 11 to form an infu-

sion with the tea beneath the retaining means 3. This formation process can be hastened by pushing the domed shell 9 towards the base 7. The shell 9 will flatten and move towards the base 7, while the mesh walls 11 will bulge as the shell 9 moves. This causes the water to move rapidly through the space beneath the retaining means, speeding up the infusion. The shell 9 will also press against the tea in the tea-bag 15 within the retaining means 3 and squeeze it, also hastening the formation of the infusion.

When the tea drink is drunk from the cup 1, the tea-bag will be retained in the base of the cup by the retaining means 3. Free leaf-tea may be used instead of a tea-bag, in which case, the holes of the mesh should be smaller than the smallest individual particles of tea.

Figure 2 shows an alternative retaining means 17 which comprises a circular mesh top 19 and a cylindrical wall 21. The wall 21 has an outward flange portion 22 which provides a close interference fit with the wall 5 of the cup 1. A tea-bag containing the tea which is to form the infusion with the boiling water is positioned on the base 7 of the cup 1, inside the retaining means 17. The water passes through the mesh top 19 of the retaining means 17 and forms an infusion with the tea therein. When the tea is drunk, the tea bag 15 is prevented from leaving the cup 1 by the mesh top 19. As in the first embodiment, leaf-tea may be substituted for the tea-bag, as long as the holes of the mesh 19 are smaller than the particles of tea.

Figure 3 shows a further form of retaining means 23 for use with a tea-bag 15. The retaining means 23 of Figure 3 comprises a solid cylindrical wall 25, and a solid circular top 27, containing a central hole 29. A tea-bag rests on the base 7 of the cup 1 and the retaining means 23 is positioned above it, being held in place by the cylindrical wall 25 forming a close interference fit with the cup wall 5. Boiling water enters the retaining means 23 through the hole 29, which is smaller than the bag 15. When the tea is drunk from the cup 1, the tea-bag is retained by the retaining means 23.

In the embodiment of Figure 4, the retaining means is in the form of a generally annular plastics framework 28 which supports two circular, highly permeable filter papers 29, 30 so that they are uniformly spaced apart to define a cylindrical space 31 therebetween. The space 31 is arranged to contain the leaves 32. The framework contains a plurality of holes 33 around its periphery and has a downwardly depending flange portion 34 which is adapted (a) to provide an interference fit with the side wall of the cup (not shown) for retaining the framework in position in the cup and (b) to engage the bottom of the cup so as to position the filter papers 29, 30 somewhat above the bottom wall of the cup. This arrangement assists in achieving a flow of water through the tea leaves during infusion.

In the arrangement of Figure 4, use is made of the provision in some cups of a small ledge or shoulder 36 in the side wall of the cup which separates a portion of slightly reduced diameter adja-

cent the bottom end of the cup. The retaining means for holding the tea leaves or tea bag can be affixed to this ledge 36, for example by heat sealing or by a suitable adhesive. This arrangement therefore does not require the provision of an interference fit between the retaining means and the cup.

Preferably, the retaining means comprises a circular disc 38 of water permeable paper which is fixed to the ledge 36 around the underside of a peripheral edge portion of the paper disc. An adhesive can be used to affix the paper disc but, more preferably, it is heat sealed to the plastics material of the ledge 36 so that the cup becomes fused to the paper. It is also preferred for the paper to be provided with a plurality of holes 40 to assist the passage of the hot water through the paper to the tea leaves constrained therebeneath. Naturally, the holes should be small enough to prevent individual tea leaves passing through.

Heat sealing of the paper to the cup is facilitated by the provision of an annular "pip" or upstanding ridge 42 around the ledge 36 as shown in Figure 5.

The invention is not restricted to the details of the foregoing embodiments. For example, the retaining means 3 in Figure 1 may have a solid cylindrical wall 11 with holes to allow passage of liquid through the wall 11 and/or the dome 9. Alternatively, the dome 9 may comprise a mesh material. In Figure 3 the circular top 27 may have other holes positioned in the top 27, or the top 27 may comprise a mesh material. The retaining means 17, 23 of Figures 2 and 3 may be held in place by a base rim giving a close interference fit with the wall 5 of the cup 1. Alternatively, the retaining means may comprise a dome of mesh material.

## CLAIMS

1. An in-cup type drink wherein tea, either in the form of loose tea-leaves or in a tea-bag, is constrained permanently adjacent the bottom of a cup by means of a liquid-permeable retaining means which is fixed to the side wall or base of the cup.
2. An in-cup type drink as claimed in claim 1, wherein the liquid-permeable retaining means is attached to a peripheral shoulder in the side wall of the cup which separates a portion of reduced diameter adjacent the bottom end of the cup.
3. An in-cup type drink as claimed in claim 2, wherein the liquid-permeable retaining means comprises a disc of liquid-permeable paper which is heat-sealed to said shoulder.
4. An in-cup type drink as claimed in claim 2, wherein the liquid-permeable retaining means comprises a disc of liquid-permeable paper which is fixed to said shoulder by an adhesive.
5. An in-cup type drink as claimed in claim 1, wherein the retaining means is fixed to the side wall of the cup by virtue of an interference fit therebetween.
6. A drinking cup comprising a base and a side wall; solid material, to form an infusion with a liquid, lying at the closed end of said cup; and a liquid-permeable retaining means, positioned

between the open end of said cup and said solid material, arranged to prevent displacement of solid residue past said retaining means during consumption of the infusion.

5 7. A drinking cup as claimed in claim 6, wherein the base and side walls are of a plastics material.

8. A drinking cup as claimed in claim 7, wherein the liquid-permeable retaining means is  
10 attached to a peripheral shoulder in the side wall of the cup which separates a portion of reduced diameter adjacent the bottom end of the cup.

9. A drinking cup as claimed in claim 8, wherein the liquid-permeable retaining means  
15 comprises a disc of liquid-permeable paper which is heat-sealed to said shoulder.

10. A drinking cup as claimed in claim 9, wherein the shoulder is provided with an upwardly directed annular ridge to assist heat sealing to the  
20 retaining means.

11. A drinking cup as claimed in claim 8, wherein the liquid-permeable retaining means comprises a disc of liquid permeable paper which is fixed to said shoulder by an adhesive.

25 12. A drinking cup as claimed in claim 6 or 7, wherein the retaining means is fixed to the side wall of the cup by virtue of an interference fit therebetween.

13. A drinking cup as claimed in claim 11 or 12,  
30 in which the paper disc contains a plurality of holes.

14. A drinking cup as claimed in claim 12, wherein the retaining means comprises a domed plastics shell, a cylindrical plastics mesh wall and a  
35 plastics base rim, the base rim being an interference fit with the side wall of the cup.

15. A drinking cup as claimed in claim 12, wherein the retaining means comprises a circular mesh top, a cylindrical wall and an outward flange,  
40 the flange being engaged with the side wall of the cup with an interference fit therebetween.

16. A drinking cup as claimed in claim 12, wherein the retaining means comprises a generally annular plastics frame which supports two circular,  
45 permeable filter papers so that they are uniformly spaced apart to define a cylindrical space therebetween, the space containing said solid material.

17. An in-cup type drink substantially as hereinbefore described with reference to and as illus-  
50 trated in the accompanying drawings.

18. A drinking cup substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.